



# How Large Industrial CHP Works – Accounting for the Benefits

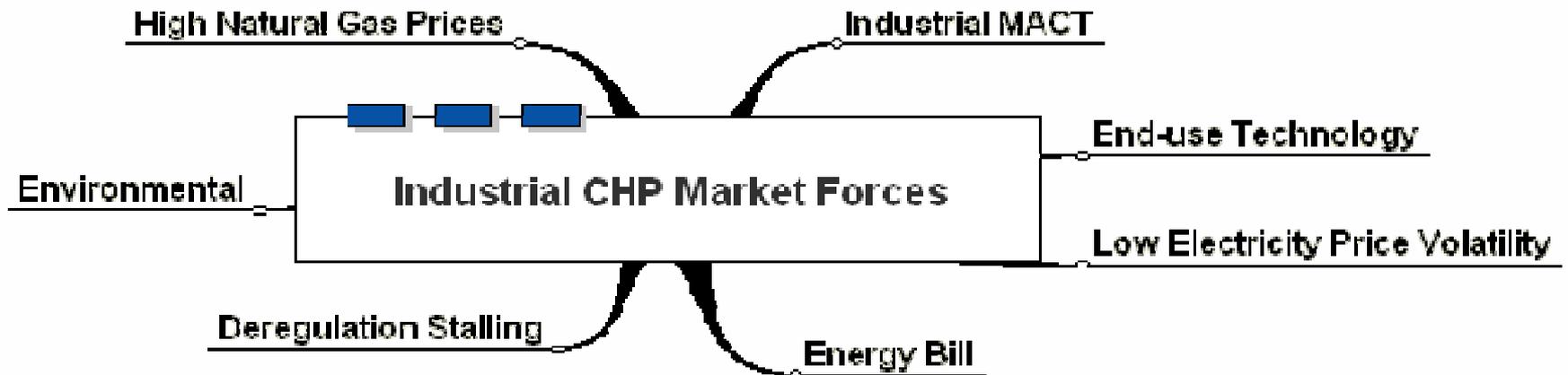
5<sup>th</sup> Annual CHP Roadmap Workshop  
September 20, 2004

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*Vice President – Market Development*

# Discussion Overview

- Market Forces
- Industrial Success Factors
- How Two Projects Were Accomplished
- New Challenges

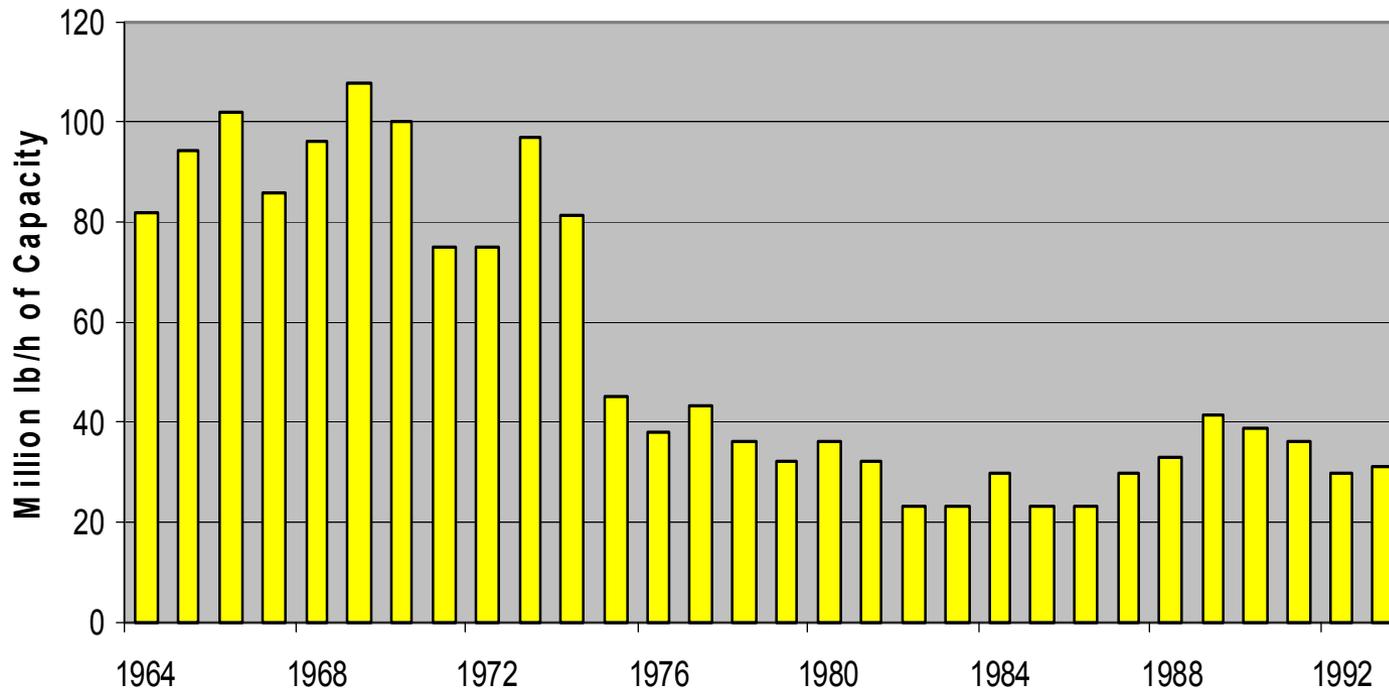
# CHP Market Forces



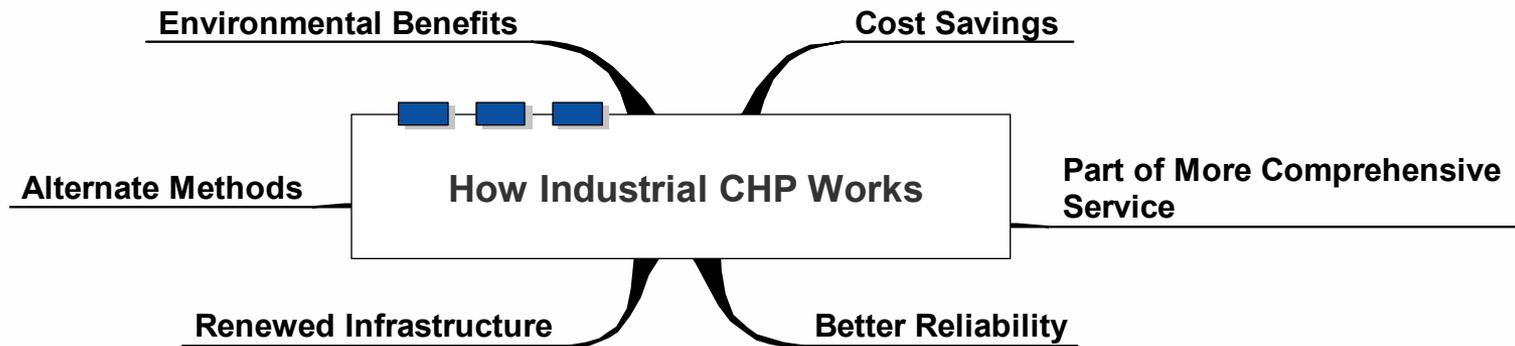
*Industrial MACT combined with the aging energy infrastructure of US industrials will provide a platform for CHP growth.*

# Aging Infrastructure

Industrial Boiler Sales, 1964 - 1993



# Industrial CHP – Success Factors



- More than one success factor is usually needed
- Environment has become more challenging

# BP Texas City



Cinergy Solutions to provide 705 MW energy services to BP Amoco refinery in Texas City.

- January 2001 – a 23 to 35 year agreement to supply all steam, electricity, and other utility services to the BP Texas City refinery
- The largest such facility in North America.

# BP Texas City – Value Drivers

- Facility energy consumption threatened to make it uncompetitive
- Aging Equipment would soon be unreliable
- Stricter Air Quality Standards resulted in major reductions of NOx.
- Corporate Sustainability Pledge

# BP Texas City - Development

- Substantial Pre-Project Planning
- Front-End Loading Concept
  - Extensive Preliminary Engineering
  - Full Cost Modeling
  - Optimum Financial Structure for Partners
- Customer Knew Cost Basis Well

# Millennium Inorganic Chemicals



Ashtabula , Ohio

- Worldwide agreement
- June, 1999 – Global energy outsourcing agreement to manage the energy systems at Millennium’s plants in the US, Brazil, Australia and France. The global agreement follows the successful closure of three project specific contracts at Millennium plants in Maryland and Ohio.

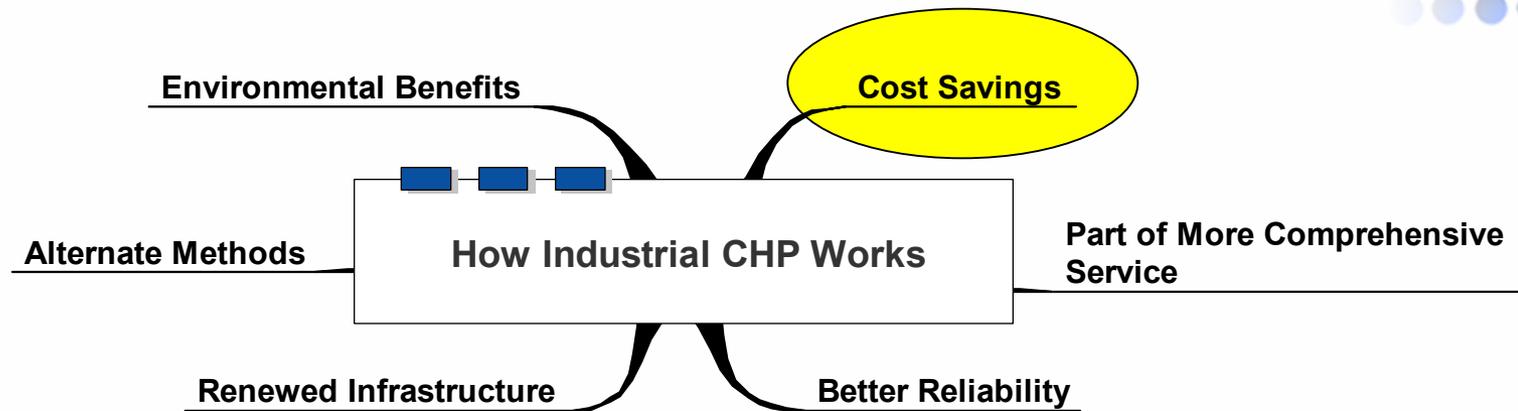
# Millennium Inorganic Chemicals

- Global Partnership Agreement
- Ashtabula, OH – Project Highlights
  - Six natural gas fired GT's with HRSG
  - 28 MW of electricity
  - 360,000 lb/hour of steam
  - *Synthetic lease of assets*
  - Black start capabilities
  - *Designed for 'island type' operations*
- Operational enhancements
  - Replaced aging coal fired generation with gas fired cogeneration plant
  - Net reduction in SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub> and particulate emissions
  - Reduced water consumption and waste disposal through new reverse osmosis water treatment system

# New Challenges

- Fuel Source Tradeoffs
  - Gas vs. Coal vs. Other (petcoke, biomass)
  - Capital vs. Operating Dilemma
- Financial Analysis
  - Finding the true cost of energy
  - Finding the best financial structure
- Risk Analysis
  - Requires detailed modeling to understand industrial customer issues and outcomes

# Conclusion



Multiple streams of value are generally necessary for Industrial CHP project success.

# Information

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